

18. Let  $P$  be the second-degree Taylor polynomial for  $e^{-2x}$  about  $x = 3$ . What is the slope of the line tangent to the graph of  $P$  at  $x = 3$ ?

- (A)  $-2e^{-6}$       (B)  $e^{-6}$       (C)  $2e^{-6}$       (D)  $4e^{-6}$       (E)  $10e^{-6}$

19. Let  $f$  be a function with second derivative  $f''(x) = \sqrt{1+3x}$ . The coefficient of  $x^3$  in the Taylor series for  $f$  about  $x = 0$  is

- (A)  $\frac{1}{12}$       (B)  $\frac{1}{6}$       (C)  $\frac{1}{4}$       (D)  $\frac{1}{2}$       (E)  $\frac{3}{2}$

20. What is the radius of convergence for the power series  $\sum_{n=0}^{\infty} \frac{(x-4)^n}{2 \cdot 3^{n+1}}$ ?

- (A)  $\frac{1}{3}$       (B)  $\frac{3}{2}$       (C) 3      (D) 4      (E) 6

21. The power series  $\sum_{n=1}^{\infty} \frac{(x-5)^n}{2^n n^2}$  has radius of convergence 2. At which of the following values of  $x$  can the alternating series test be used with this series to verify convergence at  $x$ ?

- (A) 6      (B) 4      (C) 2      (D) 0      (E) -1

22. Let  $f$  be the function given by  $f(x) = \frac{1}{2+x}$ . What is the coefficient of  $x^3$  in the Taylor series for  $f$  about  $x = 0$ ?

- (A)  $-\frac{3}{8}$       (B)  $-\frac{1}{8}$       (C)  $-\frac{1}{16}$       (D)  $\frac{1}{24}$       (E)  $\frac{1}{16}$